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TEC-CENTER 1600 2900

1647

## RAW SEQUENCE LISTING

DATE: 03/28/2002

PATENT APPLICATION: US/09/903,180B

TIME: 10:51:04

Input Set : N:\Crif3\03192002\I903180.raw

Output Set: N:\CRF3\03282002\I903180B.raw

1 <110> APPLICANT: De Robertis, Edward M.  
 2 Bouwmeester, Tewis  
 3 <120> TITLE OF INVENTION: Endoderm, Cardiac and Neural Inducing  
 4 Factors  
 5 <130> FILE REFERENCE: 510015-256  
 6 <140> CURRENT APPLICATION NUMBER: US/09/903,180B  
 7 <141> CURRENT FILING DATE: 2001-07-11  
 8 <150> PRIOR APPLICATION NUMBER: US 60/020,150  
 9 <151> PRIOR FILING DATE: 1996-06-20  
 10 <160> NUMBER OF SEQ ID NOS: 10  
 11 <170> SOFTWARE: FastSEQ for Windows Version 3.0  
 13 <210> SEQ ID NO: 1  
 14 <211> LENGTH: 270  
 15 <212> TYPE: PRT  
 16 <213> ORGANISM: Xenopus  
 17 <400> SEQUENCE: 1

18	Met	Leu	Leu	Asn	Val	Leu	Arg	Ile	Cys	Ile	Ile	Val	Cys	Leu	Val	Asn
19	1			5					10						15	
20	Asp	Gly	Ala	Gly	Lys	His	Ser	Glu	Gly	Arg	Glu	Arg	Thr	Lys	Thr	Tyr
21				20					25					30		
22	Ser	Leu	Asn	Ser	Arg	Gly	Tyr	Phe	Arg	Lys	Glu	Arg	Gly	Ala	Arg	Arg
23			35					40					45			
24	Ser	Lys	Ile	Leu	Leu	Val	Asn	Thr	Lys	Gly	Leu	Asp	Glu	Pro	His	Ile
25		50					55					60				
26	Gly	His	Gly	Asp	Phe	Gly	Leu	Val	Ala	Glu	Leu	Phe	Asp	Ser	Thr	Arg
27	65					70				75				80		
28	Thr	His	Thr	Asn	Arg	Lys	Glu	Pro	Asp	Met	Asn	Lys	Val	Lys	Leu	Phe
29				85					90					95		
30	Ser	Thr	Val	Ala	His	Gly	Asn	Lys	Ser	Ala	Arg	Arg	Lys	Ala	Tyr	Asn
31			100						105					110		
32	Gly	Ser	Arg	Arg	Asn	Ile	Phe	Ser	Arg	Arg	Ser	Phe	Asp	Lys	Arg	Asn
33			115				120						125			
34	Thr	Glu	Val	Thr	Glu	Lys	Pro	Gly	Ala	Lys	Met	Phe	Trp	Asn	Asn	Phe
35		130					135					140				
36	Leu	Val	Lys	Met	Asn	Gly	Ala	Pro	Gln	Asn	Thr	Ser	His	Gly	Ser	Lys
37	145					150				155				160		
38	Ala	Gln	Glu	Ile	Met	Lys	Glu	Ala	Cys	Lys	Thr	Leu	Pro	Phe	Thr	Gln
39				165						170				175		
40	Asn	Ile	Val	His	Glu	Asn	Cys	Asp	Arg	Met	Val	Ile	Gln	Asn	Asn	Leu
41			180					185					190			
42	Cys	Phe	Gly	Lys	Cys	Ile	Ser	Leu	His	Val	Pro	Asn	Gln	Asp	Arg	
43		195					200						205			
44	Arg	Asn	Thr	Cys	Ser	His	Cys	Leu	Pro	Ser	Lys	Phe	Thr	Leu	Asn	His

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45          210          215          220
46      Leu Thr Leu Asn Cys Thr Gly Ser Lys Asn Val Val Lys Val Val Met
47      225          230          235          240
48      Met Val Glu Glu Cys Thr Cys Glu Ala His Lys Ser Asn Phe His Gln
49          245          250          255
50      Thr Ala Gln Phe Asn Met Asp Thr Ser Thr Thr Leu His His
51          260          265          270
53 <210> SEQ ID NO: 2
54 <211> LENGTH: 1338
55 <212> TYPE: DNA
56 <213> ORGANISM: Xenopus
57 <400> SEQUENCE: 2
58      gaattccag caagtcgctc agaaacactg caggggtctag atatcataca atgttactaa      60
59      atgtactcag gatctgtatt atcgctcgtcc ttgtgaatga tggagcagga aaacactcag      120
60      aaggacgaga aaggacaaaa acatattcac ttaacagcag aggttacttc agaaaagaaa      180
61      gaggagcacg taggagcaag attctgctgg tgaatactaa aggtcttgat gaaccccaca      240
62      ttgggcatgg tgattttcgc ttagtagctg aactatttga ttccaccaga acacatacaa      300
63      acagaaaaga gccagacatg aacaaagtca agcttttctc aacagttgcc catggaaaca      360
64      aaagtgcag aagaaaagct tacaatgggt ctagaaggaa tatttttctt cgccgttctt      420
65      ttgataaaag aaatacacag gttactgaaa agcctgggtg caagatgttc tggaacaatt      480
66      ttttggttaa aatgaatgga gccccacaga atacaagcca tggcagtaaa gcacaggaaa      540
67      taatgaaaga agcttgcaaa accttggttt tcaactcagaa tattgtacat gaaaactgtg      600
68      acaggatggt gatacagaac aatctgtgct ttggtaaagt catctctctc catgttccaa      660
69      atcagcaaga tcgacgaaat acttgttccc attgcttgcc gtccaaattt accctgaacc      720
70      acctgacgct gaattgtact ggatctaaga atgtagtaaa ggttgctcat atggtagagg      780
71      aatgcacgtg tgaagctcat aagagcaact tccaccaaac tgcacagttt aacatggata      840
72      catctactac cctgcaccat taaaggactg ccatacagta tggaaatgcc cttttgttgg      900
73      aatatttgtt acatactatg catctaaagc attatgttgc cttctatttc atataaccac      960
74      atggaataag gattgtatga attataatta acaaattggc ttttgtgtaa catgcaagat      1020
75      ctctgttcca tcagttgcaa gataaaaggc aatatttgtt tgactttttt tctacaaaat      1080
76      gaatacccaa atatatgata agataatggg gtcaaaactg ttaaggggta atgtaataat      1140
77      agggactaag tttgcccagg agcagtgacc cataacaacc aatcagcagg tatgatttac      1200
78      tggtcacctg tttaaaagca aacatcttat tggttgctat gggttactgc ttctgggcaa      1260
79      aatgtgtgcc tcataggggg gttagtgtgt tgtgtactga ataaattgta tttatttcat      1320
80      tgttacaaaa aaaaaaaaaa                                     1338
82 <210> SEQ ID NO: 3
83 <211> LENGTH: 318
84 <212> TYPE: PRT
85 <213> ORGANISM: Xenopus frazzled
86 <400> SEQUENCE: 3
87      Met Ser Arg Thr Arg Lys Val Asp Ser Leu Leu Leu Leu Ala Ile Pro
88      1          5          10          15
89      Gly Leu Ala Leu Leu Leu Leu Pro Asn Ala Tyr Cys Ala Ser Cys Glu
90          20          25          30
91      Pro Val Arg Ile Pro Met Cys Lys Ser Met Pro Trp Asn Met Thr Lys
92          35          40          45
93      Met Pro Asn His Leu His His Ser Thr Gln Ala Asn Ala Ile Leu Ala
94          50          55          60
95      Ile Glu Gln Phe Glu Gly Leu Leu Thr Thr Glu Cys Ser Gln Asp Leu

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96	65	70	75	80
97	Leu Phe Phe Leu Cys Ala Met Tyr Ala Pro Ile Cys Thr Ile Asp Phe			
98		85	90	95
99	Gln His Glu Pro Ile Lys Pro Cys Lys Ser Val Cys Glu Arg Ala Arg			
100		100	105	110
101	Ala Gly Cys Glu Pro Ile Leu Ile Lys Tyr Arg His Thr Trp Pro Glu			
102		115	120	125
103	Ser Leu Ala Cys Glu Glu Leu Pro Val Tyr Asp Arg Gly Val Cys Ile			
104		130	135	140
105	Ser Pro Glu Ala Ile Val Thr Val Glu Gln Gly Thr Asp Ser Met Pro			
106		145	150	155
107	Asp Phe Ser Met Asp Ser Asn Asn Gly Asn Cys Gly Ser Gly Arg Glu			
108		165	170	175
109	His Cys Lys Cys Lys Pro Met Lys Ala Thr Gln Lys Thr Tyr Leu Lys			
110		180	185	190
111	Asn Asn Tyr Asn Tyr Val Ile Arg Ala Lys Val Lys Glu Val Lys Val			
112		195	200	205
113	Lys Cys His Asp Ala Thr Ala Ile Val Glu Val Lys Glu Ile Leu Lys			
114		210	215	220
115	Ser Ser Leu Val Asn Ile Pro Lys Asp Thr Val Thr Leu Tyr Thr Asn			
116		225	230	235
117	Ser Gly Cys Leu Cys Pro Gln Leu Val Ala Asn Glu Glu Tyr Ile Ile			
118		245	250	255
119	Met Gly Tyr Glu Asp Lys Glu Arg Thr Arg Leu Leu Leu Val Glu Gly			
120		260	265	270
121	Ser Leu Ala Glu Lys Trp Arg Asp Arg Leu Ala Lys Lys Val Lys Arg			
122		275	280	285
123	Trp Asp Gln Lys Leu Arg Arg Pro Arg Lys Ser Lys Asp Pro Val Ala			
124		290	295	300
125	Pro Ile Pro Asn Lys Asn Ser Asn Ser Arg Gln Ala Arg Ser			
126		305	310	315

128 &lt;210&gt; SEQ ID NO: 4

129 &lt;211&gt; LENGTH: 1875

130 &lt;212&gt; TYPE: DNA

131 &lt;213&gt; ORGANISM: Xenopus frazzled

132 &lt;400&gt; SEQUENCE: 4

133	gaattccctt tcacacagga ctccctggcag aggtgaatgg ttagccctat ggatttggtt	60
134	tgttgatttt gacacatgat tgattgcttt cagataggat tgaaggactt ggatttttat	120
135	ctaattctgc acttttaaata tatctgagta attgttcatt ttgtattgga tgggactaaa	180
136	gataaactta actccttgct tttgacttgc ccataaacta taagggtggg tgagttgtag	240
137	ttgcttttac atgtgccag attttccctg tattccctgt attccctcta aagtaagcct	300
138	acacatacag gttgggcaga ataacaatgt ctcgaacaag gaaagtggac tcattactgc	360
139	tactggccat acctggactg gcgcttctct tattacccaa tgcttactgt gcttcgtgtg	420
140	agcctgtgcg gatcccatg tgcaaatcta tgccatggaa catgaccaag atgcccacc	480
141	atctccacca cagactcaa gccaatgcca tccctggcaat tgaacagttt gaagggttgc	540
142	tgaccactga atgtagccag gaccttttgt tctttctgtg tgccatgtat gccccattt	600
143	gtaccatcga tttccagcat gaaccaatta agccttgcaa gtccgtgtgc gaaagggcca	660
144	gggccggtg tgagcccatt ctcataaagt accggcacac ttggccagag agcctggcat	720
145	gtgaagagct gcccgatat gacagaggag tctgcatctc cccagaggct atcgtcacag	780

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146      tggaacaagg aacagattca atgccagact tctccatgga ttcaaacaat ggaaattgcg      840
147      gaagcggcag ggagcactgt aaatgcaagc ccatgaaggc aacccaaaag acgtatctca      900
148      agaataatta caattatgta atcagagcaa aagtgaaga ggtgaaagtg aaatgccacg      960
149      acgcaacagc aattgtggaa gtaaaggaga ttctcaagtc ttccctagtg aacattccta     1020
150      aagacacagt gacactgtac accaactcag gctgcttggt cccccagctt gttgccaatg     1080
151      aggaatacat aattatgggc tatgaagaca aagagcgtac caggcttcta ctagtggaag     1140
152      gatccttggc cgaaaaatgg agagatcgct ttgctaagaa agtcaagcgc tgggatcaaa     1200
153      agcttcgacg tcccaggaaa agcaaagacc ccgtggctcc aattcccaac aaaaacagca     1260
154      attccagaca agcgcgtagt tagactaacg gaaagggtga tggaaactct atggactttg     1320
155      aaactaagat ttgcattgtt ggaagagcaa aaaagaaatt gcactacagc acgttatatt     1380
156      ctattgttta ctacaagaag ctggtttagt tgattgtagt tctcctttcc ttcttttttt     1440
157      ttataactat atttgacgtt gttcccaggc aattgtttta ttcaacttcc agtgacagag     1500
158      cagtgcactga atgtctcagc ctaaagaagc tcaattcatt tctgatcaac taatggtgac     1560
159      aagtgtttga tacttgggga aagtgaacta attgcaatgg taaatcagag aaaagttgac     1620
160      caatgttgct tttcctgtag atgaacaagt gagagatcac atttaaataga tgatcacttt     1680
161      ccatttaata ctttcagcag ttttagttag atgacatgta ggatgcacct aaatctaaat     1740
162      attttatcat aaatgaagag ctggtttaga ctgtatggtc actgttggga aggtaaatgc     1800
163      ctactttgtc aattctgttt taaaaattgc ctaaataaat attaagtcct aaataaaaaa     1860
164      aaaaaaaaaa aaaaaa                                     1875

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166 &lt;210&gt; SEQ ID NO: 5

167 &lt;211&gt; LENGTH: 896

168 &lt;212&gt; TYPE: PRT

169 &lt;213&gt; ORGANISM: Xenopus

170 &lt;400&gt; SEQUENCE: 5

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171      Met Leu Leu Leu Phe Arg Ala Ile Pro Met Leu Leu Leu Gly Leu Met
172      1          5          10          15
173      Val Leu Gln Thr Asp Cys Glu Ile Ala Gln Tyr Tyr Ile Asp Glu Glu
174      20          25          30
175      Glu Pro Pro Gly Thr Val Ile Ala Val Leu Ser Gln His Ser Ile Phe
176      35          40          45
177      Asn Thr Thr Asp Ile Pro Ala Thr Asn Phe Arg Leu Met Lys Gln Phe
178      50          55          60
179      Asn Asn Ser Leu Ile Gly Val Arg Glu Ser Asp Gly Gln Leu Ser Ile
180      65          70          75          80
181      Met Glu Arg Ile Asp Arg Glu Gln Ile Cys Arg Gln Ser Leu His Cys
182      85          90          95
183      Asn Leu Ala Leu Asp Val Val Ser Phe Ser Lys Gly His Phe Lys Leu
184      100         105         110
185      Leu Asn Val Lys Val Glu Val Arg Asp Ile Asn Asp His Ser Pro His
186      115         120         125
187      Phe Pro Ser Glu Ile Met His Val Glu Val Ser Glu Ser Ser Ser Val
188      130         135         140
189      Gly Thr Arg Ile Pro Leu Glu Ile Ala Ile Asp Glu Asp Val Gly Ser
190      145         150         155         160
191      Asn Ser Ile Gln Asn Phe Gln Ile Ser Asn Asn Ser His Phe Ser Ile
192      165         170         175
193      Asp Val Leu Thr Arg Ala Asp Gly Val Lys Tyr Ala Asp Leu Val Leu
194      180         185         190
195      Met Arg Glu Leu Asp Arg Glu Ile Gln Pro Thr Tyr Ile Met Glu Leu

```